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Date: March 2, 2010
Refer To: ENV-RCRA-10-044
LAUR: 10-01176

Ms. Sonia Hall
US Environmental Protection Agency, Region 6
Compliance and Assurance Division
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Mr. Richard Powell
Surface Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, N2050
1190 St. Francis Drive
PO Box 5469
Santa Fe, NM 87502-5469

Dear Ms. Hall and Mr. Powell:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, OUTFALL 051 FINAL REPORT TOXICITY REDUCTION EVALUATION ACTIVITIES

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for Los Alamos National Laboratory requires the National Nuclear Security Administration and Los Alamos National Security, LLC and (NNSA/LANS) to submit to the U. S. Environmental Protection Agency (EPA) and New Mexico Environment Department, Surface Water Quality Bureau (NMED-SWQB) the Final Report on Toxicity Reduction Evaluation (TRE) activities when two consecutive Whole Effluent Toxicity (WET) tests (compliance test and first retest) fail to meet the passing criteria defined in the NPDES Permit. The NNSA/LANS TA-50 Radioactive Liquid Waste Treatment Facility (Outfall 051) submitted the TRE Action Plan and Schedule on January 31, 2008 to EPA and NMED. Additionally, quarterly TRE Activities Reports have been submitted with the NNSA/LANS Discharge Monitoring Reports (DMRs).

This Final Report on TRE activities includes the identification of the specific classes of compounds responsible for the Radioactive Liquid Waste Treatment Facility effluent toxicity (metals and organics). It also identifies the specific metals copper and zinc. This Final Report also summarizes work accomplished, proposed continued work and control mechanism selected, and the corrective action schedule required to reduce the effluent toxicity to no significant lethality at the critical dilution

of 100% effluent (Enclosure 1). Two Toxicity Identification Evaluation (TIE) reports, which identify the cause of the effluent toxicity are also included (Enclosure 2 and Enclosure 3).

Please contact Marc Bailey at (505) 665-8135, of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

DeMarie Sandoval DGL

for Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group
Los Alamos National Laboratory

Sincerely,

Gene E. Turner

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
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ARG:GET:MB/lm

Enclosures: a/s

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ENCLOSURE 1

Enclosure 1

RLWTF WET Testing Activities and Compliance Schedule

The Whole Effluent Toxicity (WET) test has been included in the National Pollutant Discharge Elimination System (NPDES) permit that regulates the discharges from the Los Alamos National Laboratory's Radioactive Liquid Waste Treatment Facility (RLWTF) which discharges treated effluent to the environment via Outfall 051.

- From January 2007, the RLWTF has contracted with Pacific EcoRisk, LLC (PER) in Fairfield, CA to perform US EPA acute (48-hr) *Daphnia pulex* WET tests on 12 NPDES compliance samples and for 4 operational (non-NPDES compliance) samples. Six of these WET tests have passed; ten have failed.
- Waste acceptance criteria for influents to the facility and the waste profile forms for wastewaters being accepted at the RLWTF were reviewed. This effort did not identify any sources of toxicity being accepted in the influent.
- In the attempt to identify the source of the toxicity, water quality parameters of the RLWTF effluent have been analyzed. Parameters included pH, dissolved oxygen, alkalinity, hardness, conductivity, total ammonia, metals (Cu, Zn, Ag, Pb, Ni, Cr), cyanide, total residual chlorine, chemical oxygen demand, plus 25 additional metals and anions. Evaluation of this data was inconclusive in the determination of the source of the effluent toxicity, which has resulted in contracting with PER to perform Toxicity Identification Evaluations (TIE) on the RLWTF effluent.
- Two TIEs were performed by PER on RLWTF effluent samples. One TIE indicated that the toxicity was predominantly due to copper, with the rest of the toxicity coming from a non-metal source. The second TIE concluded that the effluent water toxicity was due to metals and organics in the effluent. These results to date indicate the toxicity in the RLWTF effluent is due to metals, predominantly copper, and to organic materials.
- Funding was obtained in Fall 2009 to install a metals removal system from the RLWTF effluent. The engineering design for the system was completed in early 2010.

Corrective Actions (CA):

1. Task PER to provide confirmatory information regarding the role of copper as the cause of toxicity. In addition, task PER to investigate further the non-metal contaminant that is contributing to the toxicity. Completion Date: April 23, 2010
2. Install an ion exchange system to "polish" copper and zinc from the RLWTF effluent to levels that will eliminate the effluent's toxicity due to metals. Completion Date: July 31, 2010
3. Based upon the results of CA # 1, evaluate technologies for the removal of toxicity caused by organics in the RLWTF effluent. Completion Date: November 1, 2010
4. If required, install technologies to eliminate the RLWTF effluent's toxicity due to organics. Completion Date: July 31, 2011